

ABCO Technical Bulletin

Choosing the Correct Caulking for the Job

Choosing and applying caulking is one of those jobs where skimping on quality or selecting the wrong product will come back to haunt you. In choosing caulking, you need to consider a number of important factors. What different materials must the caulk bond to? How long of service life do you want? Will the caulk be applied in damp conditions? Will the cured joint be exposed to heavy moisture loads? How much joint movement do you expect? The cost is always a consideration, but the extra money you spend on a good caulk is minor when compared to the cost of a callback.

The purpose of caulking is to control air and water infiltration. Each type of caulking is designed for a specific application (certain crack size, substrate, flexibility, etc.). Some products are called "20-year" or "30-year" sealants. These terms are only useful when comparing products from the same manufacturer; they don't mean that the product will last 20 or 30 years. Specifications, not marketing labels, are the way to compare products. The technical data sheets for each caulk will specify maximum joint size and movement, adhesion in peel (how well the sealant sticks), application temperature, paintability, and shelf life.

There are four types of polymer used to manufacture most high-performance caulks: silicones, polyurethanes, latex acrylics, and the solvent-based synthetic rubbers. Typically, polyurethane caulks provide the best all-around performance for exterior applications. ASTM E 2112-01 in table A4.2 gives guidance in sealant adhesion to assist in proper caulking selection.



TABLE A4.2 Sealant Adhesion

NOTE: 1—N/A = Not Applicable
 N/R = Not Recommended
 G = Good = Adhesion of 5 PLI and 75 % cohesive failure minimum as measured by Test Method C 794
 F = Fair = Adhesion of 5 PLI and less than 75 % cohesive failure as measured by Test Method C 794
 P = Poor = Adhesion less than 5 PLI and predominantly adhesive failure

Sealant Type	Silicone		Latex		Polyurethane		Solvent Release		Butyl Tape		Notes About Substrates
	C 920	C 920	C 834	C 920	C 1085	C 1311	AAMA 809	AAMA 804			
Aluminum Mill Finish	G	G	F	G	G	P-G	G	G			
Aluminum Anodized	G	G	F	G	G	P-G	G	G			
Building Paper (Asphalt)	P-G	P-G	P-G	P-G	P-G	P-G	G	G		Compatibility with solvent release sealants shall be verified	
Brick	G	G	F	G	G	P-G	NA	NA			
Concrete	F-G	F-G	P-F	G	G	P-G	G	P		Adhesion in areas of prolonged moisture exposure shall be verified	
Copper	P-G	P-G	P-F	F-G	G	P-G	G	G		Some sealants can produce corrosion	
EIFS	F-G	F-G	P-F	F-G	NR	NR	NA	NA		Test Method C 1382 is used to determine adhesion to finish or base coats	
Steel Galvanized	P-G	P-G	P-F	P-G	G	P-G	G	G			
Glass	G	G	F	P-G	F	P-G	NA	G		Test Method C 794 after ultraviolet exposure is used to determine adhesion	
Painted Surfaces	P-G	P-G	P-G	P-G	P-G	P-G	G	P-G		Adhesion of a specific sealant product and job site coating(s) should be verified	
Polyethylene	P	P	P	P-G	P-G	P-F	G	G			
Stone	G	G	F	G	G	F-G	G	P-F		Resistance to vehicle migration and staining should be verified	
Stucco	G	G	F	G	F-G	F-G	NA	NA			
Vinyl	P-G	P-F	P-F	P-G	P-G	P-G	G	P-G		Cleaning by Isopropyl Alcohol wipe is recommended	
Wood Raw	G	G	F-G	G	F-G	P-G	G	P-G			
Wood Treated	G	G	F-G	G	F-G	P-G	G	P-G			

Silicone

Silicone is capable of between 25% to 50% joint movement, it stays flexible for years, and will not dry out and lose flexibility when exposed to ultraviolet radiation. It does not shrink or harden with age and most brands will not hold paint.

Polyurethane

Polyurethane is durable; has excellent movement capability; will stick to most surfaces, including wood and concrete; shrinks very little; is paintable and may not cost much more than a good acrylic latex or silicone. Polyurethane lasts as long as silicone, expands and contracts up to 25%, and has a larger maximum joint size than acrylic latex or silicone.

Acrylic Latex with Silicon

Acrylic latex is the most popular sealant for residential work. It is also the most commonly misused sealant. Although the best acrylic latex sealants are enhanced with silicone to increase flexibility and improve adhesion, the word "siliconized" means very little. Manufacturers vary in how much silicone they use.

Type	Joint Movement	Life Expectancy	Comments
Silicone	50%	20 yrs	Very low shrinkage, may be applied over the widest range of temperatures; not paintable, poor adhesion to damp surfaces and to masonry.
Polyurethane	25%	20-30 yrs	Best all-purpose caulk; excellent adhesion to most materials; difficult to clean up.
Acrylic Latex w/ Silicon	10%	10-20 yrs	Easy to work with; cleans up with water.
Acrylic Latex	2%	4-10 yrs	Interior application only; east to work with; cleans up with water.
Butyl Rubber	5%-10%	4-10 yrs	Poor adhesion on damp surfaces; attracts dirt; difficult to handle.

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Sealants used for door and window installation must stay in place, stick to all adjoining surfaces, and be able to stretch. Some window manufacturers are starting to publicize lists of sealants that are compatible with their products. The American Architectural Manufactures Association (AAMA) refers to the 800 series of tests, "Voluntary Specifications and Test Methods for Sealants."

Latex or siliconized latex sealants are not recommended for window and door installation as they do not conform to the AAMA 800 standard. Latex and silicone sealants do not adhere well to the various coatings on the flexible flashing materials, most housewrap material, and the vinyl on window and door units. Sealants chosen for use with flexible flashings should not contain appreciable amounts of xylene. The xylene will degrade the elastomeric flashing.

Sealing all exterior wall penetrations (mechanical, plumbing, and electrical) is vital to ensure the exterior moisture barrier (grade D building paper or housewrap) is completely sealed. Due to the many different materials (copper, PVC, metal, plastic,

etc.), selecting the correct sealant is critical. Polyurethane sealant is suggested to seal all exterior penetrations due to its excellent adhesion to the various materials.

ABCO Construction Services Corporation has developed this information for its clients and friends. The information may contain citations of applicable codes, manufacturers recommendations, and best practices from noted sources.

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